

“In plumage it greatly resembles the broader-billed but closely allied *C. Burkii* of India. Middle of crown olive-yellow, which occupies the inner webs of the feathers, the outer webs being deep fuscous, nearly black, with an olive tinge, forming a broad dark stripe on each side of the crown: between this and the eye is a superciliary streak of clear yellow: a streak of fuscous passes through the eye; the cheeks, throat, and lower parts are bright yellow, with an olive tinge; back and wings yellowish-olive: beak horn-coloured, the base of lower mandible pale; and legs brown.

“Inhabits the island of Java.”—Strickland.

XVI.—On Fossil Echinoderms from the Island of Malta; with Notes on the stratigraphical distribution of the Fossil Organisms in the Maltese beds. By THOMAS WRIGHT, M.D. &c., Professor of the Natural Sciences in the Cheltenham Grammar School.

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Family SPATANGIDÆ.

The general outline of the Urchins of this family is oval, oblong or cordiform, and they satisfactorily exhibit the bilateral symmetry of the *Echinidæ*. The mouth is anterior, bilabiate, and edentulous. The anal opening is posterior and supramarginal, and is closed by a complicated series of small plates. The apices of the ambulacral areas are united at the summit of the test. The anterior single ambulacrum has a different structure from the antero- and postero-lateral pairs, and is in general lodged in a depression of the test, which extends to the anterior border forming the antea sulcus; the test is extremely thin, and is covered with small tubercles which support hair-like spines; besides these there are some larger crenulated and perforated tubercles which support large spines. There are two or four genital pores which are sometimes placed close together, but are in other genera apart. The eye-plates are five in number, and are placed at the apices of the ambulacra in a pentagonal form around the genital plates. We observe on the surface of the test of some *Spatangidæ*, certain delicate lines called *fascioles*, having a smoother appearance than the tubercular surface of the test; they are furrows which are strewed with microscopic tubercles destined to carry very delicate spines, which, when seen under the microscope, appear to have the same structure as the *Pedicellariæ*. The *fascioles* have a different disposition in each genus, and afford a good character in giving definitions of the same; when the

fasciole surrounds the ambulacral petals like an undulating groove, as in *Hemiasiter*, *Schizaster*, &c., it is said to be a *peripetal*; when it surrounds the single ambulacrum, as in *Amphidetes*, it is *internal*; when it extends along the sides, as in *Schizaster*, it is *lateral*; when it surrounds the circumference of the test, as in *Pericosmus*, it is *marginal*; when it is limited to the base of the anal opening, it is *subanal*. We find sometimes in the same genus more fascioles than one; thus the subanal and peripetal are frequently associated together.

Genus SPATANGUS (Klein, 1734).

Urchins, in general large with a thin test, a convex dorsal surface, and the antero-lateral and postero-lateral ambulacral areas composed of larger petals than in other *Spatangidae*. The anterior ambulacrum is lodged in a deep anteal sulcus; the upper part of the anterior border of the antero-laterals is obliterated towards the summit.

Numerous very large crenulated and perforated tubercles are scattered over the surface of the ambulacral plates. They have a deeply grooved subanal fasciole; only four genital pores, the anterior pair more closely approached than the posterior pair.

Five perforated ocular plates, arranged in the form of a pentagon, around the genital pores. A tube or hollow cone at the internal part of the single interambulacrum. A large vertical plate passing into a cone arises from the internal surface of the test upon the left side of the mouth, and is directed obliquely upwards and backwards.

The species are living or fossil in the tertiary rocks.

Spatangus Hoffmanni, Goldfuss.

SYN. *Spatangus Hoffmanni*, Goldf. Petrefacta, Band i. p. 152. tab. 47. fig. 3 a, b, c; Desmoulins, Etudes sur les Echinides, p. 398. no. 35; Grateloup, Mém. Echinid. Foss. tab. 1. fig. 8. p. 73; Agassiz and Desor, Ann. Sc. Nat. tom. viii. p. 7.

Echinus (petrefactus), Scilla, Corp. Mar. pl. 10. fig. 1.

Test convex, depressed anteriorly, elevated and carinated posteriorly; antero-lateral and postero-lateral interambulacra with numerous large, perforated and crenulated tubercles, surrounded by deep sunken areolas; base convex, the postero-lateral areas with large tubercles; interambulacrum forming a tumid projection at the base; mouth and anus large; marginal fold acute; the pores in the zones large, disposed in wide-set pairs.

Dimensions. — Antero-posterior diameter $2\frac{2}{10}$ inches, trans-

verse diameter 2 inches ; height anteriorly $\frac{7}{10}$ ths of an inch, height posteriorly $\frac{17}{20}$ ths of an inch.

Description.—The characters of this form of *Spatangus* are so prominent and well defined, that one is astonished that between the time of Scilla, who first figured it, and that of Goldfuss, who first described it, no zoophytologist should have become its historian. The dorsal surface of the test is broad, convex, and depressed anteriorly, and narrow, elevated, and carinated posteriorly ; the ambulacral areas are well defined, the single ambulacrum with its rudimentary pores is lodged in a wide but shallow antea sulcus, and there is a flattened plateau between the sulcus and the apical disc ; in this region the obsolete pores are clearly seen : the antero-lateral ambulacral areas extend outwards at an angle of 24° from a transverse line drawn through the apical disc* : the posterior poriferous zone extends two-thirds of the distance between the disc and the border ; the anterior zone commences much farther from the disc above, but extends as far as the posterior zone below ; thus in the specimen before us, there are fourteen pairs of pores in the posterior, and only nine in the anterior zone : the postero-lateral ambulacral areas extend backwards, and towards their termination they curve gracefully outwards ; the angle they form at the transverse line at the disc is 62° , and there are twenty pairs of pores in each of the zones. Each of the interambulacral areas presents peculiar characters ; the antero-lateral pair are the smallest, and the postero-lateral are the largest ; they are both remarkable for the tubercles they support on their dorsal surface ; in the anterior pair there are nine, and in the posterior pair there are fourteen of these tubercles on each side of the test, which are sculptured out of the substance of the plates ; as they do not project beyond the general surface of the shell, each tubercle is seated on a cylinder, which is surrounded by a deep, wide depression : as these perforations are not arranged with much regularity, the test has the appearance of having been bored by some marine mollusk. The tubercles themselves, in proportion to the size of the supporting cylinder and encircling entrenchment, are small and perforated ; the single interambulacrum is narrow and elongated, and rises in the mesial line into a prominent elevated ridge ; the posterior border is obliquely truncated downwards and inwards, in the upper part of this space the large anal opening is situated ;

* It may be as well to state, that we have adopted this mode of measuring the amount of divergence of the antero-lateral and postero-lateral areas rather than the vague expressions formerly in use. The angle is measured from a transverse line which cuts the longitudinal axis at right angles at the apical disc ; we have found the degree of divergence to be very uniform in each species.

below, the interambulacrum forms another prominence marked by two concave depressions on each side thereof, from which a wide, gently sloping central space occupies the middle of the ventral surface, having the large transversely-oblong mouth-opening with its projecting posterior lip occupying the anterior third of the base; on the sides of this sloping central space the basal portions of the postero-lateral interambulacra are thickly studded with large slanting perforated tubercles, arranged with much regularity in this region, and a few smaller tubercles are scattered over the basal portion of the antero-lateral pair; the crescentic depressions below the anus have each a group of perforated tubercles, and between them and the smooth central concave portion of the base is the subanal fasciole, which forms a transverse band in the middle, and a crescent on each side, the upper cornua of which approaches the anal opening; below the fasciole there is another group of small perforated tubercles and a copious granulation; the crescentic depressions, subanal fasciole, and this group form together a triangle, the base of which lies before the anus, and its apex points towards the mouth; around this opening five pair of short poriferous zones indicate the termination of the ambulacral areas.

Affinities and differences.—The form of the ambulacral areas, the shortness of the anterior poriferous zone, and the size and depth of the areolar spaces around the cylinders of the large tubercles, together with the carinated elevation in the middle of the interambulacrum, form a group of organic characters which sufficiently distinguish this species from its congeners. In *Spatangus Desmarestii*, which is found with *S. Hoffmanni* in the same beds in Westphalia, the size of the test, the absence of very deep areolas on the dorsal surface, the equal length of the poriferous zones of the anterior ambulacra, and the much smaller tubercles at the base, easily enable us to distinguish it from *S. Hoffmanni*.

Stratigraphical range and localities.—It is found at Malta in bed No. 4, the calcareous sandstone, and in Westphalia; it has been collected from the Miocene at Doberg near Bünde, and at Astrapp near Osnabruck.

Spatangus De Koninckii, Wright, n. sp.

Test cordate, depressed before, elevated behind by the development of dorsal and basal median carinæ on the single interambulacrum; ambulacral areas short and broadly petaloid; antea sulcus slight; depression of the single ambulacrum inconsiderable; several large tubercles between the petaloidal ambulacra; posterior border obliquely truncated downwards and forwards; anal opening large and circular; basal tubercles

of moderate size; basal portions of the postero-lateral ambulacra form two smooth tracks destitute of tubercles between the posterior border and the mouth.

Dimensions.—Antero-posterior diameter $1\frac{6}{10}$ inch; transverse diameter $1\frac{4}{10}$ inch; height at the interambulacrum $\frac{1}{2}$ ths of an inch.

Description.—An imperfect specimen of this Urchin was at first mistaken for a small variety of *Spatangus Desmarestii*, Goldf., and entered under that name in the list of fossils from bed No. 2. Having lately obtained a better specimen of this form, we are now enabled to give a description of it, which will be found to differ in many essential points from that species, to which it was at first referred. The test is regularly cordate, slightly flattened at the checks, bulging out at the sides, and from thence tapering abruptly towards the posterior border, where it is truncated obliquely downwards and forwards; the anterior part of the test is flattened and depressed, and the posterior portion much elevated, from the circumstance of the single interambulacrum forming two prominent ridges, one on the dorsal, and the other on the basal surface, which gives increased depth to the test, tilts it up, and forms an inclined plane of the dorsal surface. The petaloidal ambulacra are short, broad and leaf-like; the anterior pair are slightly flexed forwards and form an angle of about 15° ; their anterior poriferous zone is nearly as complete as the posterior zone, which contain respectively sixteen and eighteen pairs of pores; the posterior pair form two oval leaflets, the bases and apices of which are nearly equally curved, and closed with pores, having about eighteen pairs of pores in each zone; they describe an angle of about 60° . The single anterior ambulacrum makes a very slight depression on the upper part of the anterior region, and the anteal sulcus formed by it is inconsiderable when compared with other congeneric forms; the anterior and lateral pairs of interambulacra carry a few large crenulated and perforated tubercles on the upper part of their dorsal surface; on the anterior pair there are from seven to eight, and on the posterior pair from four to five of these tubercles, which are neither so large nor yet have such deep areolas as their homologues in *S. Hoffmanni*. The single posterior interambulacrum is narrow, but greatly developed in the vertical diameter; above, a blunt prominent ridge commences near the apical disc and extends to the posterior border; below, another ridge commences a short distance from the truncated portion of the border, and extends to the centre of the mouth; the base is slightly convex from side to side, besides being raised in the middle of its posterior part by the ridge just

alluded to. The tubercles on the basal portions of the anterior and posterior interambulacra are not very large, but are disposed with great regularity; those on the ridge-like prominence of the single interambulacrum are arranged in lines which radiate in all directions from a point; those on the pairs gradually decrease in size from the mouth to the border; between these two groups of tubercles there is on each side a smooth track, corresponding with the course of the postero-lateral ambulacra from the border to the mouth: the anus is large and circular, and occupies the upper part of the posterior border; the subanal fasciole is denuded; the mouth is likewise large and transversely oval, and is situated near the antean sulcus. The apical disc is excentral, being situated about the anterior part of the middle third of the test; it is small, and is perforated with four genital holes. The superficial layer of the calcareous plates, which carries all the fine sculpture of the test, is almost entirely denuded from the dorsal surface; one or two fragments alone remain to show that the tuberculation was minute and close-set.

Affinities and differences.—This species is distinguished from *S. Hoffmanni* by the excessive elevation of the posterior part of the test; by the shorter, wider and more oval form of the petaloid ambulacra; by the poriferous zones of the anterior pair being more complete; by the large dorsal tubercles being smaller and fewer in number; by having a less impressed antean sulcus; a convex base, with smaller tubercles; a ridge-like projection, with a regular tuberculation of the basal portion of the interambulacrum, with smooth naked ambulacral tracks on each side thereof. From *S. Desmarestii* it is distinguished by its short, broad, petaloidal ambulacra, which are long and attenuated in *S. Desmarestii*; by the greater size, number and regularity of the large dorsal tubercles, which are few, small and scattered in *S. Desmarestii*; the posterior region is not at all elevated in *S. Desmarestii*, and the anus is transversely oblong, whilst in *S. De Koninckii* the posterior part is much elevated, and the anal opening is round.

S. Desmarestii has a few groups of large tubercles on the upper part of the single interambulacrum, which are entirely absent both in *S. Hoffmanni* and *S. De Koninckii*. The basal region is so much covered up with matrix in the specimen of *S. Desmarestii* before us, that we cannot institute a comparison between this portion of its test and that of *S. De Koninckii*.

Locality and stratigraphical range.—The two or three specimens we have seen in the Earl Ducie's cabinet were collected from the clay bed No. 2 at Malta; they have all a deep ferruginous colour, and are not well preserved. We dedicate this species to our friend Dr. De Koninck of Liège, the learned

author of several memoirs on the palæontology of the carboniferous rocks of Belgium.

Genus *BRISSUS* (Klein, 1734).

Form oval; the ambulacral summit excentral, and situated near the anterior border; the antero- and postero-lateral ambulacral areas straight, and lodged in shallow depressions of the test; the anterior pair are nearly transverse, the posterior pair deviating slightly from the longitudinal direction. The single ambulacrum very simple in structure; no antecal sulcus; the peripetal fasciole very sinuous; mouth large, labiate, and near the anterior border; anal opening large, situated in the middle of the posterior surface; the subanal fasciole approximated close to the anus. Four genital pores, the anterior pair smaller and nearer each other than the posterior pair. The madreporiform tubercle situated between the posterior genital openings; five perforated ocular plates placed before the genital pores and alternating with them. This genus contains a greater number of living than of fossil species; the existing forms are limited to the seas of warm latitudes; the fossil species are found only in the tertiary rocks.

Brissus latus (Wright, n. sp.). Pl. V. fig. 1 a-c.

Test convex and much depressed above; transverse and antero-posterior diameters nearly equal; ambulacral areas of nearly equal length; the single ambulacrum lodged in a deep antecal sulcus; antero-lateral pair curved gently forwards; peripetal fasciole very zigzag and angular; apical disc $\frac{3}{10}$ ths of an inch before the centre of the disc; base slightly convex; sternal process of the single interambulacrum raised before the anus, having a central elevated ridge and numerous large tubercles arranged in regular order on its surface; subanal fasciole enclosing a space $1\frac{7}{10}$ inch in diameter; anus situated in an oblique truncation below the margin; mouth $\frac{7}{10}$ ths of an inch from the anterior border; the large tubercles of moderate size.

Dimensions.—Antero-posterior diameter $4\frac{1}{20}$ inches, transverse diameter $3\frac{9}{10}$ inches; height at the vertex 1 inch.

Description.—This *Brissus* is readily recognized by its broad and depressed dorsal surface; the ambulacral areas form deep depressions in the test; the single ambulacral area lies in an inconsiderable valley on the dorsal surface, but forms rather a deep antecal sulcus; the antero-lateral pair curve gently outwards and forwards, forming an angle of 21° , with the transverse line at

right angles with the longitudinal axis of the test; the postero-lateral pair are directed obliquely backwards at an angle of 55° ; both pairs lie in rather deep valleys, and the poriferous zones contain from twenty-eight to thirty pairs of pores in each avenue. The peripetal fasciole (1 a) makes an angular zigzag track, closely embracing the apices of the ambulacral areas. In the space which it bounds on the fore part of the shell, having for its base the antero-lateral areas, and its apex the antean sulcus of the single ambulacrum, a number of large perforated tubercles set on crenulated eminences are arranged in groups (1 c), the areolas of these tubercles are surrounded by small granules, and amongst them smaller tubercles are interposed; a few large tubercles occupy the angles between the apices of the antero-lateral and postero-lateral pairs, and likewise in the angle formed between the postero-laterals themselves; the rest of the dorsal surface is covered with small tubercles closely set together; each tubercle is perforated and raised on a crenulated eminence (1 c), and surrounded by a smooth depressed areola; the base is slightly convex; the sternal portion of the single interambulacrum is rather prominent behind, but slopes gently towards the mouth; it has an elevated ridge in the centre, and is covered with tubercles of a larger size than those of the upper surface, and which are arranged in regular rows. The subanal fasciole is of considerable extent, it forms a semicircle which passes across the most prominent part of the base, and sends its cornua upwards at a considerable distance from the anus; the basal portions of the pairs of the interambulacral areas are covered with tubercles similar to those on the sternal part; a naked track corresponding to the postero-lateral areas separates these tuberculated portions of the base. The mouth is situated near the anterior border, it is widest in the transverse diameter, and has a thick projecting under lip; the terminations of the ambulacral areas surround the mouth, and form poriferous zones around that opening: the anus is situated beneath the margin in an oblique truncation of the posterior border; the opening is much crushed in our specimen, so that its form is not discernible. The apical disc (1 b) is placed near the centre of the back, about $\frac{3}{10}$ ths of an inch before that point: the madreporiform tubercle is small and pyriform, and is situated behind the four genital pores: the margin of the shell is thin and acute.

Affinities and differences.—The breadth of the test and the depression of the dorsal surface thereof, with the curve forwards in the ambulacral areas, and the depth of the antean sulcus, form a group of characters by which *Brissus latus* is readily distinguished from its congeners. Out of the seven fossil species, registered but not described in Agassiz and Desor's Catalogue,

two only are figured, and for this reason we are unable to make a comparison with them.

Locality and stratigraphical range.—Only one specimen of this species, in the Earl Ducie's cabinet, was collected from bed No. 1, the Gozo marble, at Malta, so that we conclude the species is rare, as it is not contained in either of the other collections of Maltese Urchins examined by us. The Jermyn Street Museum contains a specimen, which is supposed to be identical with this form.

Brissus imbricatus (Wright, n. sp.).

Test oblong, much depressed; no anteal sulcus; peripetal fasciole narrow, lodged in a groove; rest of the dorsal surface fractured; base convex; mouth large, and situated near the anterior border; sternal portion of the interambulacrum with a regular ornamentation. The subanal fasciole very near the anus is heart-shaped and narrow; it encloses rows of tubercles which are arranged in radii in regular order; before the fasciole the test forms a projection, and from the summit thereof, rows of tubercles arranged in straight lines extend towards the mouth, increasing in size as they approach that opening; the basal portions of the other interambulacral areas are covered with scale-like imbricated plates, each carrying an oval eminence with a crenulated summit, and a tubercle placed at the anterior side of the oval eminence; these tubercles are all regularly arranged in rows which have a direction forwards and outwards: the postero-lateral ambulacra form a naked space, which separates the imbricated basal portions of the pairs of interambulacra from the ornamented sternal portion of the single one. The anus is large and situated at the posterior border; both this opening and the mouth are much injured.

Dimensions.—Antero-posterior diameter $3\frac{5}{10}$ inches, transverse diameter 3 inches, height $\frac{3}{10}$ ths of an inch.

Description.—The detailed diagnosis given of this species contains nearly all that we can describe of this *Brissus*, for, with the exception of a small portion of its anterior part preserving a portion of the peripetal fasciole, all the rest is absent; the regularity in the arrangement of the tubercles at the base constitutes a characteristic feature of this form, and the imbricated style of the basal plates, resembling the tegumentary membrane of a placoid fish, gives value to the specific name.

Affinities and differences.—The order and symmetry of the decoration of the sternal portion of the interambulacrum, the heart-shaped subanal fasciole, with its broad band of microscopic granules, and the leaf-like tuberculated expansion which extends

from the apex of the fasciole, are very characteristic of this species; if to these we add the imbricated style of the plates occupying the sides of the base, and the oblique way the tubercles are set on their oblong bases, we have an assemblage of organic characters by which *B. imbricatus* may be readily distinguished from its congeners. The form of the test, the size of the tubercles, the symmetry of the subanal rosette, formed by radii of tubercles, and encircled by a broad fasciole, readily separate it from *B. latus*, with which it is associated in the same stratum.

Locality and stratigraphical position.—This species was collected from bed No. 1, the Gozo marble, at Malta: it is the property of the Bristol Institution.

Brissus oblongus (Forbes MSS., n. sp.). Pl. V. fig. 2 a-c.

Test oblong, depressed before, elevated behind; dorsal surface convex; anterior border rounded, with a slight antecal sulcus; antero-lateral ambulacral areas slightly bent forwards, and nearly forming right angles with the longitudinal axis; postero-lateral ambulacra make an angle of 68° ; the anterior are shorter than the posterior pair; posterior border produced and truncated: anus large, oval, and placed high up: base convex, sternal portion prominent, greatest width across the base of the postero-lateral ambulacra.

Dimensions.—Antero-posterior diameter $2\frac{1}{10}$ inch, transverse diameter $1\frac{9}{10}$ inch, height $1\frac{1}{10}$ inch.

Description.—This small *Brissus* has an oblong form, and is rounded before and truncated behind; the anterior half of the test is more depressed than the posterior half; the single interambulacrum rises into a ridge-like eminence on the back, and the sternal portion thereof is much inflated at the base, so that the greatest height of the test is in this region. The antero-lateral ambulacra (2 a) are shorter than the posterior pair, and are extended across the test nearly at right angles to the longitudinal axis; the postero-lateral ambulacra are longer than the anterior, and form angles of 68° ; the petaloid portions of both areas are depressed; the anterior pair have eighteen pairs of pores, the posterior pair have twenty-four pairs of pores in their poriferous zones: the single ambulacrum is not lodged in a rudimentary antecal sulcus, and is nearly on a level with the contour of the test, the front and cheeks of which are convex, with four groups of larger tubercles in this region; the sides slope obliquely downwards to the border, which is obtuse: the single interambulacrum is raised into a ridge above, and produced into a blunted caudal process, obliquely truncated behind: the base (2 b) is convex, chiefly from the arched form which the sternal portion of the interambulacrum

assumes : the mouth is large, near the anterior third of the base : the anus is of an elliptical form, and occupies more than the upper half of the truncated portion of the posterior border. The peripetal fasciole (2 *a*) closely embraces the ambulacral pairs, and makes three angles in passing over the anterior interambulacra ; the subanal fasciole (2 *b*) describes a heart-shaped outline, its base is near the anus, and its apex touches the prominent point of the sternum ; the space thereby circumscribed is filled with tubercles having a definite arrangement. The apical disc is small, with four genital pores, the posterior pair being much larger than the anterior pair ; the tubercles (2 *c*) on the anterior interambulacra are much the largest, those on the rest of the back are small and very uniform in size, whilst those on the sternum and the sides of the base are intermediate in size ; the basal tracts of the ambulacral areas are destitute of tubercles ; as they approach the mouth they are again perforated with a single row of holes ; those of the antero-laterals extend as far as the border, whilst the single and posterior pair have only two or three pairs of their plates perforated.

Genus BRISSOPSIS (Agassiz, 1840).

Form elongated, subcylindrical ; ambulacral areas straight, short, and wide, converging near the summit of the test ; peripetal fasciole flexuous, closely surrounding the ambulacral areas ; two or four genital pores, the posterior larger than the anterior pair ; five ocular plates disposed nearly equally apart in a pentagonal form around the genital openings ; subanal fasciole wide, and situate at a considerable distance below the anal opening ; single ambulacrum lodged in an anteal sulcus ; the basal portions of the ambulacra are wide and naked ; the tubercles are very uniform in size, and are crenulated and perforated. Three living species ; the rest are fossil in the tertiary rocks.

Brissopsis Duciei (Wright, n. sp.). Pl. VI. fig. 1 *a-e*.

Test oblong, depressed anteriorly, elevated posteriorly ; apical disc central ; ambulacral areas forming concave depressions ; single ambulacrum the longest and widest ; antero-lateral pair straight, angle of inclination 34° ; postero-lateral shorter, angle of inclination 55° ; peripetal fasciole broad and undulating ; anus oval, large, situated high on the border ; base concealed ; dorsal tubercles small, nearly of a uniform size, except on the sides and the anterior part, where they are larger.

Dimensions. — Large specimen. Antero-posterior diameter $3\frac{4}{10}$ inches, transverse diameter $3\frac{2}{10}$ inches : height cannot be accurately measured.

Small specimen. Antero-posterior diameter $1\frac{9}{10}$ inch, transverse diameter $1\frac{7}{10}$ inch; height over the middle of the single ambulacrum $\frac{9}{10}$ ths of an inch, at the highest point of the dorsal region $1\frac{1}{10}$ inch.

Description.—This beautiful Urchin is one of the most typical forms of the group to which it naturally belongs. The test is oblong and inclined, from the height of the anterior third being less by $\frac{2}{10}$ ths of an inch than the posterior third; the ambulacral areas are all well developed, and arranged in the form of a St. Andrew's cross; as the apical disc is situated near the centre of the body, the regularity of their arrangement forms a conspicuous character of this species. The anterior ambulacrum (1 *a*) is concave, and makes an inconsiderable anteat sulcus; there is a single row of pores, flanked by a row of tubercles on each side, with a space between filled by a microscopic granulation; it is abruptly bounded below by the fasciole, and terminates at the disc in a blunt lancet-shaped apex. The antero-lateral ambulacra in the large specimen are $\frac{5}{10}$ ths of an inch longer than the posterior pair, and form an angle of 37° with the transverse line through the disc; they are round at the base and blunted at the apex, and the anterior side is more rounded off than the posterior for the reception of the apex of the ambulacrum; in the anterior zone there are twenty, and in the posterior zone twenty-four pairs of holes. The postero-lateral pair describe an angle of 55° ; both pairs form concave valleys; the pores in the zones are of the same size, and are pierced so wide apart (1 *c*) that the pores of each pair are nearly as distant from each other as the width of the space which separates the two avenues; in the anterior ambulacral avenues there are twenty in the anterior and twenty-four in the posterior zone; in the posterior pair the numbers are twenty-two before and eighteen behind. The peripetal fasciole (1 *e*) has an unequal width in different parts of its track; it is narrow where it passes over elevations of the test, or is bent into angles, and becomes wider in other parts of its course. The apical disc (1 *a*) is small, heart-shaped and central; the two anterior genital holes are smaller and placed closer together than the posterior pair; the five eye-holes as usual are situated at the summit of the ambulacral apices: the madreporiform tubercle occupies the surface of the posterior triangular genital plate. The anus is a large oblong opening, situated in the upper half of the posterior border, at the distance of $\frac{7}{10}$ ths of an inch from the fasciole in the small individual. The base in both specimens is concealed; the tubercles (1 *d*) are small, crenulated and perforated, and nearly of the same size; a few larger ones occupy the sides of the anterior ambulacral sulcus; the sides of the ambulacral areas and as much of their basal portions as is exposed are destitute of tubercles.

Affinities and differences.—*Brissopsis Duciei* is readily distinguished from the other forms of this genus met with in the Maltese beds, by the full development of its ambulacral areas, their straightness, width and depth. The double crescent formed by the ambulacral areas in *B. crescenticus* is a sufficient character by which it may at a glance be distinguished from *B. Duciei*.

Locality and stratigraphical position.—This species was collected from bed No. 1, the Gozo marble, at Malta, where it is rare; the two specimens before us are the only ones we have seen. We dedicate this fine species to the Earl Ducie, whose valuable collection of Maltese fossils has added to our previous knowledge of the palæontology of the island, and whose geological map of Malta so well exhibits the distribution of the various beds with their faults and denudation.

Brissopsis crescenticus (Wright, n. sp.). Pl. VI. fig. 2 a-c.

Test oblong, rounded before and truncated behind; flattened on the dorsal surface, and deeply indented by the ambulacral areas; the ambulacrum forms an antecal sulcus; the anterior and posterior ambulacra on each side form two lateral crescents that abut at the longitudinal line; the antero-lateral pair are the longest and widest, they curve forwards and backwards, and the posterior pair curve backwards and forwards; the anterior pair form an angle of 45° , the posterior pair an angle of 65° ; the apical disc lies in a depression formed by the confluence of the apices of all the ambulacra; the posterior border is squarely truncated, with the anal opening in its upper angle; the base is convex, with few tubercles and wide naked spaces formed by the basal portions of the ambulacra; the mouth is situated in the anterior third.

Dimensions.—Antero-posterior diameter $1\frac{6}{10}$ inch, transverse diameter $1\frac{4}{10}$ inch, height $\frac{8}{10}$ ths of an inch.

Description.—The most remarkable feature in this species consists in the mode of arrangement of the ambulacra; the anterior and posterior areas of each side curve in opposite directions and form crescents, the convexities of which are directed towards the middle line of the test, and give value to the name proposed. The antero-lateral pair form an angle of 45° ; they are about the same length as the posterior pair, but are a little broader and are more divergent: there are nineteen pairs of holes in the external zone, and fourteen in the inner; the posterior pair are nearly parallel with each other, and have a slight curve forwards to form the posterior horn of the crescent; they are not so much developed as the anterior pair; the external zone of holes contains fifteen pairs, but the inner zone (2 c) is imperfectly

developed, from their close approximation to those of the opposite area: the apical disc is small; the four genital holes are large, the anterior pair being more closely approximated than the posterior pair; it is situated nearer the anterior than the posterior border and lies in a confluent depression, in which the apices of all the areas freely converge. The single ambulacrum is rather longer, but not so wide as the anterior pair; its lateral row of single holes, with their accompanying tubercles, are small and indistinctly seen, and it forms an inconsiderable anteal sulcus: the posterior border is squarely and obliquely truncated, and in its upper part near the dorsal surface is the large anal opening: the base is rather convex; the sternal portion of the single interambulacrum is slightly prominent, and ornamented with a few rows of rather larger tubercles disposed in zigzag lines: the basal tracks of the ambulacral areas are entirely naked, and where they terminate around the mouth five petaloid poriferous radii are observed. The mouth, of moderate size, is in the anterior third; the peripetal fasciole is narrow and indistinct; the subanal fasciole is much broader, and remote from the anus, but the test is unfortunately broken in this region; the tubercles are nearly all of the same size, but a few larger ones occupy the sides, front, and base.

Affinities and differences.—The flatness of the dorsal surface, the deep depressions made by the petaloid portion of the ambulacral areas, and the double crescent formed by them, readily distinguish *B. crescenticus* from its congeners. So few fossil species of this genus have been figured or described, that we can only compare it with the other forms obtained from the same bed, from both of which it differs in many well-marked characters.

Locality and stratigraphical position.—It was collected from bed No. 4, the calcareous sandstone at Malta, where it is rare.

Genus HEMIASTER (Desor, 1847).

Urchins with a high and much inflated test; ambulacral summit nearly central; the petaloid portions of the ambulacral areas situated in depressions more or less deep; the antero-lateral are in general much longer than the postero-lateral pair; the peripetal fasciole only surrounding in an angular manner the ambulacral star. This genus differs from *Micraster* in all the species having a more inflated body with a peripetal fasciole; from *Brissopsis* in having the postero-lateral ambulacra in general much shorter, and the anterior and posterior pairs more unequal in length, and likewise in having no subanal fasciole. A very few species are found in the tertiaries, the majority belonging to the cretaceous rocks.

Hemiaster Grateloupi (Sismonda sp.).

SYN. *Schizaster Grateloupi*, E. Sismonda, Echin. Foss. Piem. p. 27.
tab. 2.

Hemiaster Grateloupi, Desor, Ann. Sc. Nat. tom. viii. p. 19.

Test orbicular, convex above and below, with tumid inflated sides: the single ambulacrum short, shallow and narrow; the antero-laterals long, deep and diverging; angle of inclination 25° ; the postero-lateral pair slightly curved inwards; angle of inclination 62° ; both pairs lie in deep depressions: the peripetal fasciole broad and undulating: the single interambulacrum forming a dorsal ridge: posterior border abruptly truncated: anal opening high near the upper surface: apical disc small and central.

Dimensions.—Antero-posterior diameter $2\frac{8}{10}$ inches, transverse diameter 3 inches, height $1\frac{8}{10}$ inch.

Description.—The orbicular form and inflated sides of this Urchin, with its large, deep, diverging ambulacra, and greater diameter in the transverse than in the longitudinal direction, impart to it an air which widely distinguishes it from other Hemiasters. The single ambulacrum is narrow and shallow, and forms an inconsiderable antea sulcus, which measures $1\frac{1}{40}$ inch in length from the apex to the fasciole; it has a single row of lateral holes and accompanying tubercles of small size placed near each other within, and the holes only at considerable distances apart without the fasciole. The antero-lateral ambulacra are rather wider and much deeper than the single area; they are $1\frac{2}{10}$ inch in length, and are directed forwards and outwards, forming an angle of 25° ; the walls of the depression are formed by the poriferous zones, and the base by the intervening smooth space between them: the postero-lateral ambulacra are directed obliquely backwards and gently curved inwards; they are 1 inch long and form an angle of 62° : the peripetal fasciole closely embraces the base of the areas, and maintains a nearly uniform width throughout its course: the test is very much inflated anteriorly and laterally, and its posterior border is abruptly truncated: the single interambulacrum is elevated into a ridge, which rises between the two posterior ambulacra, at the termination of which the anal opening is situated: the test is covered with small, nearly equal-sized tubercles, which are larger on the fore-part, cheeks, and sides than elsewhere: the apical disc is small, and lies in a depression at the centre of the test, the apices of the interambulacra rising into little eminences around it: the base is entirely concealed by the matrix.

Affinities and differences.—This large species differs so much from its congeners in its breadth, in the depth and divergence of

the antero-lateral ambulacra, which are likewise slightly curved forwards, in the length and depth of the posterior pair, which equal the single ambulacrum in length, in the breadth and extent of the peripetal fasciole, and the perpendicular truncature of the posterior border, with the general tumidity of its sides, that it is readily distinguished from them.

Locality and stratigraphical position.—It was collected from bed No. 4, the calcareous sandstone at Malta, and is one of the few tertiary Urchins in our cabinet; it is the only specimen of the species we have seen.

Hemiaster Cotteaui, Wright. Pl. VII. fig. 2 *a-d*.

Test orbicular, globose, much inflated, declining anteriorly, elevated posteriorly, the interambulacrum forming a prominent carina which terminates in a tail-like process above the anus; posterior border obliquely truncated; ambulacral areas deeply sunk; an anteal ambulacrum forms the sulcus in the anterior border; antero-laterals long, and inclined to 45° ; postero-laterals one-half the length of the anterior pair, inclined to 57° ; apical disc nearly central; peripetal fasciole broad and undulating; anus high under the carinal process; tubercles larger on the sides and base than on the dorsal surface; mouth labiate near the anterior border.

Dimensions.—Antero-posterior diameter $1\frac{1}{2}\frac{9}{10}$ inch, transverse diameter $1\frac{1}{2}\frac{9}{10}$ inch, height $1\frac{1}{2}\frac{1}{10}$ inch.

Description.—This Urchin has a globose form, and is much inflated at the sides; the dorsal surface is convex, and declines much more rapidly from the apical disc to the anterior border, than from the disc to the posterior border. The ambulacral areas (2 *a*) are all deeply sunk; the single ambulacrum is the longest, and forms a considerable anteal sulcus; the antero-lateral pair have a gentle double curve; they are $\frac{7}{10}$ ths of an inch in length, and form an angle of 45° . The number of pores (2 *c*) in the avenues is twenty-two pairs in the inner, and twenty-four in the outer zone; the postero-lateral pair are scarcely half the length of the anterior pair; they incline at 57° ; their number of pores is ten and twelve pairs. The peripetal fasciole (2 *d*) closely embraces the ambulacral star; a naked track proceeds from the base of the antero-laterals to the mouth, indicating the course of the imperforate portion of the ambulacral areas: the rapid declivity of the anterior part of the test strongly contrasts with the inflated condition of the sides and the elevation of the interambulacrum; from the centre of this area a ridge rises which is produced into a tail-like process, and beneath, the posterior border is scooped out, and truncated obliquely downwards and

inwards. The anus is situated high up, immediately beneath the caudal prolongation; the base is convex, and a partially naked space on each side of the sternal portion of the interambulacrum, indicates the track of the basal portions of the posterior ambulacras. The tubercles of the upper surface (2 b) are smaller and more closely set together than those on the sides and base, where they are larger, wider apart, and more fully developed. They are perforated and uncrenulated, and surrounded by a circle of small tubercles. *H. Cotteauii* resembles *Spatangus (Hemiaster) acuminatus*, Goldf., but it is more globose, and its posterior half is neither so elevated, nor yet so wedge-shaped as that species; the single ambulacrum is larger and wider, and the antero-lateral pair are more developed in the German than in the Maltese form; they resemble each other in the interambulacrum in both possessing a tail-like terminal process, and in having the posterior border obliquely scooped out; they are both, likewise, Miocene Urchins, *S. acuminatus* being found in that terrain near Cassel and Düsseldorf (Germany), and at Bordeaux and Blaye (France).

Affinities and differences.—The depth and length of the ambulacral areas, with the great declivity of the anterior side of the test, and the post-discal carina, with its caudate-like process, serve to distinguish this species from *H. Scilla*.

Locality and stratigraphical position.—Collected from bed No. 4, the calcareous sandstone at Malta. We dedicate this species to our friend M. Cotteau, the learned author of 'Études sur les Échinides Fossiles du département de l'Yonne,' who has most generously aided us in our studies, by contributing the types of many of his species to our cabinet for comparative investigations.

Hemiaster Scilla, Wright, n. sp. Pl. VII. fig. 1 a-f.

SYN. *Spatangus crassissimus*, Desmoulins, Études sur les Échinides, p. 394. no. 30.

Echinus, Scilla, Corp. Mar. pl. 10. fig. 4.

Test globular, higher behind than before; ambulacral areas short; single ambulacrum the longest, forming a deep sulcus on the anterior border; antero-laterals wide, diverging at an angle of 44° ; postero-laterals not half the length of the anteriors, forming an angle of 56° ; both pairs form sulci on the sides of the test: posterior border squarely truncated downwards and outwards: the anus high near the dorsum: base convex: mouth at the anterior third, with a large projecting under lip.

Dimensions.—Antero-posterior diameter $1\frac{9}{10}$ inch, transverse diameter $1\frac{7}{10}$ inch, height $1\frac{4}{10}$ inch.

Description.—Much confusion has arisen as to the identity of this Urchin, occasioned probably by the circumstance of Scilla having figured only the base of the test, and neglected to give either its profile or the dorsal surface. In M. Agassiz's 'Prodrômus' it was entered as *Micraster Goldfussii*, but has been omitted from Agassiz and Desor's 'Catalogue raisonné.' M. Desmoulins identifies it with the *Spatangus crassissimus* of DeFrance, but on referring to the original description* of that species, we find that DeFrance's species came from "la craie chloritée near Havre," and as no species of Urchin known to us passed from the secondary to the tertiary epoch, we must reject the high authority of this most accurate naturalist, and consider the Urchin before us as distinct from *S. crassissimus*. The test inclines to an oblong form (1 c); it is higher behind than before, and declines more rapidly from the disc to the anterior border than from the disc to the anus. The ambulacral areas lie in deep depressions; the single ambulacrum (1 e) is the longest, and forms an inconsiderable anteal sulcus; the antero-laterals are $\frac{4}{10}$ ths of an inch in length, and form an angle of 44° ; the number of the pores (1 f) in the zones is fifteen and twenty: the postero-laterals are scarcely one-half the length of the antero-laterals; they form an angle of 56° ; the number of pores in them is respectively seven and ten: the peripetal fasciole is broad, but feebly marked, and closely embraces the bases of the areas: four sulci (1 a), nearly destitute of tubercles, mark the course of the ambulacra from the side of the fasciole to the mouth: the lateral interambulacra are rather inflated, and marked by five or six angular elevations (1 c) of the test: the single interambulacrum is elevated on the dorsum (1 a), squarely truncated on the posterior border, and convex beneath: the small oval anus is situated very high up, about $\frac{6}{10}$ ths of an inch from the disc: the sternal portion of the interambulacrum (1 b) is convex and prominent, and is covered with close-set tubercles, arranged in lines, proceeding like radii from a central point of the base: the mouth has a large projecting under-lip. The upper part of the shell is covered with small close-set uncrenulate tubercles (1 d), which are larger and irregularly disposed on the front and base: the apical disc is small and nearly central: there are only two genital holes at the apices of the lateral ambulacra: the five eye-holes are very small. Whether one pair of genital holes may be a generic character of *Hemiaster*, we have not the means at present of determining, as most of our specimens of this group have the disc concealed; but about the beautiful *H. Scilla* now before us there can be no question.

* Dict. Sc. Nat. tom. 50. p. 96.

Affinities and differences.—The absence of the dorsal carina and caudal process serve to distinguish *H. Scillæ* from *H. Cotteavii*; the latter is likewise a more globose and less elegant form of Urchin, and has the truncature of the posterior border downwards and forwards, whereas in *H. Scillæ* the direction is downwards and backwards.

Locality and stratigraphical position.—Collected from No. 4, the calcareous sandstone at Malta, from whence the original specimen figured by Scilla was obtained: this reason will suffice for the name we have given it.

Genus PERICOSMUS (Agassiz, 1847):

In addition to the general characters of *Hemiaster*, these Urchins have an arched arrangement of the peripetal fasciole and a narrow marginal fasciole, which can be traced round the anterior border, extending along the sides, passing beneath the anus, meeting its fellow from the opposite side, and thereby encircling the test. All the species of this small group have been obtained from strata of the Miocène age.

Pericosmus latus, Desor.

SYN. *Micraster latus*, Agassiz, Cat. Syst. p. 2.

Pericosmus latus, Agassiz and Desor, Cat. raisonné, Ann. Sc. Nat. tom. vi. pl. 16. fig. 1, & tom. viii. p. 19.

Test cordate, broad, convex above, flat below; petaloidal ambulacra straight, deep-sunk and narrow; the posterior nearly as long as the anterior pair; apical discs central; peripetal fasciole closely embracing the ambulacra, with three arches across the single ambulacral depression; marginal fasciole narrow, entirely surrounding the upper part of the border of the test.

Dimensions.—Antero-posterior diameter $2\frac{7}{10}$ inches; transverse diameter $2\frac{7}{10}$ inches; height $1\frac{3}{10}$ inch.

Description.—This rare type of one of the extinct genera of *Spatangidæ* was at first mistaken for a *Micraster* by Agassiz, and entered in his 'Catalogus Systematicus' under the name *Micraster latus*; the peripetal fasciole, however, readily distinguishes it from *Micraster*, and the marginal fasciole from *Hemiaster*. No doubt many mistakes will be committed regarding this Urchin, as these fascioles are exceedingly delicate, and not always preserved: when they are absent, it then greatly resembles a *Micraster*; but when the marginal fasciole is effaced, and the peripetal remains, it then may be mistaken for a *Hemiaster*; fortunately, in one of the specimens before us, the fascioles are both

preserved, and their entire course can be traced. The test has a uniformly curved dorsal surface, with a regular cordate form, the base is slightly convex, and the posterior border is truncated. The petaloid portions of the ambulacral areas are straight, and lodged in rather deep depressions, extended obliquely outwards on the middle of the dorsal surface, in the form of a St. Andrew's cross; the single ambulacrum lies in a deep wide depression, and forms a considerable anteal sulcus; at its apical portion only, there are from ten to twelve pairs of ambulacral plates, each perforated in the centre with a single hole; in all the other plates in the area the perforations are obsolete; the antero-lateral ambulacra, $\frac{1}{2}\frac{5}{10}$ ths of an inch in length, are nearly straight, having only very slight *f*-shaped flexures, which curve forwards and outwards, making an angle of 35° : the two poriferous zones lie close together, in deep narrow depressions; in each zone there are from twenty-four to twenty-six pairs of holes; the space between the pairs of pores is only a little more than that which separates one row of pores from another, so that the pores lie nearly equidistant from each other in the sunken areas; the postero-lateral ambulacra are $\frac{1}{2}\frac{3}{10}$ ths of an inch in length, and are extended backwards and outwards at an angle of 60° ; there are from twenty to twenty-two pairs of holes in each zone, the rows of which, like those on the anterior pair, are nearly equidistant: the peripetal fasciole closely surrounds the posterior ambulacral pair, makes two angles on their sides, and crosses to the anterior pair, where it in like manner forms two angles, then sweeps round the base, and passes in a straight line along the anterior side; from it three branches proceed inwards, which arch over the single ambulacrum, describing angles as they advance to meet the branches from the opposite side; the marginal fasciole is a narrow line, which passes above the fold of the border and entirely encircles the test, dipping into the anteal sulcus in its course, but its position in relation to the anus is not clearly shown in either of our specimens. Agassiz figures it as passing under the anus; in his figure the remarkable arches on the anterior part are not drawn: the apical disc is small, and occupies the centre of the test; it has only two genital holes like a *Hemiaster*, and five small ocular holes; the upper surface of the test is covered with small, nearly equal-sized tubercles, those on the anterior side are a little larger; the base is slightly convex, the lateral interambulacra carry large tubercles on their basal plates, and the sternal portion of the interambulacrum is likewise covered with a regular tuberculation; the basal tracks of the posterior ambulacra are smooth between the border and the mouth; the anus is situated high

up on the posterior border, and the mouth lies very close to the anteal sulcus.

Affinities and differences.—The central position of the apical disc and the depth and straightness of the ambulacra distinguish this form from *P. excentricus*; the generic affinities of this small genus have been already pointed out. The rarity of *Pericosmus*, and the small number of species and individuals at present known, limit our comparisons to the forms we have cited.

Locality and stratigraphical range.—This is one of the few Urchins found in the clay bed No. 2 at Malta: we have before us a specimen from Balistro, Corsica, from the miocene beds of that island, sent us by M. Michelin of Paris; we consider the peculiar arch-like arrangement of the peripetal fasciole, with the marginal, as good generic characters whereby to form a distinct genus.

Pericosmus excentricus, Wright, n. sp.

Test oblong, highly convex above, slightly so below; apical disc very excentral, near the anterior border; ambulacra in shallow depressions; single ambulacrum slightly grooves the anterior border; antero-laterals nearly transverse; postero-laterals incline at 55° ; peripetal fasciole narrow and undulating; marginal fasciole narrow and low on the border; tubercles on the upper surface small, close-set, and nearly all of the same size; a few larger ones on the anterior interambulacra; anus large and situated high on the border; mouth-opening wide in the anterior third, surrounded by five poriferous petaloid zones; sternal portion of the interambulacrum convex, with close-set imbricated tuberculigerous plates; basal portions of the interambulacral pairs with larger tubercles, wider apart, and more irregular than those of the dorsum.

Dimensions.—Antero-posterior diameter 2 inches, transverse diameter $1\frac{8}{10}$ inch, height 1 inch?

Description.—This Urchin is so much crushed that it is impossible to describe its outline. The ambulacral areas form shallow depressions, and the single area slightly grooves the anterior border: the antero-laterals are nearly transverse, their inclination being forwards; they are $\frac{8}{10}$ ths of an inch in length: the postero-laterals form an angle of 55° ; they are $\frac{5}{10}$ ths of an inch long. The crushed state of the test makes it impossible to count accurately the pores, or give the breadth of the areas; the apical disc, with four genital pores, is very small and remarkably excentral, being very near the anterior border; the peripetal fasciole is narrow, angular and undulating, and instead of surrounding the anterior part of the antero-lateral ambulacra, as in

P. latus, it descends from them and joins the marginal fasciole below their base, so that the anterior sides of the antero-laterals, and the single ambulacrum, want the peripetal fasciole. The specimen before us is so much crushed, that we cannot trace the band continuously all round the test, so as to describe its course with accuracy; it is possible that this species may form the type of a distribution of the fascioles distinct from any that is yet known. We have stated enough to show, that at least in this form there is a considerable deviation from the normal arrangement. The anus is large and oval, and near the dorsum; the mouth is wide and bilabiate, and situated near the border; the sternal portion of the interambulacrum is slightly convex, and thickly covered with an imbricated arrangement on the plates, on each of which a perforated tubercle is raised. The basal portions of the interambulacral pairs are covered with wider-set tubercles of the same size, and the entire upper surface of the test is crowded with small tubercles closely set together, and very uniform in size and arrangement. The mouth is surrounded by five petaloid poriferous ambulacra.

Affinities and differences.—The excentric position of the disc, with its four genital holes, and the petaloid poriferous ambulacra around the mouth, establish an affinity between this form and *Brissus*. The way in which the peripetal joins the marginal fasciole is similar to what exists in *Schizaster*, whilst the marginal fasciole, entirely encircling the test and passing round beneath the anus, is found only in *Pericosmus*. The excentral position of the apical disc and the shallowness of the ambulacral star form a sufficient diagnosis between this species and *P. latus*.

Locality and stratigraphical position.—Collected from bed No. 1, the Gozo marble at Malta, where it is rare.

[To be continued.]

XVII.—On the Genera *Pionandra*, *Cliocarpus* and *Pæcilochroma*.
By JOHN MIERS, Esq., F.R.S., F.L.S. &c.

PIONANDRA.

THE details of this genus as given in Lond. Journ. Bot. iv. 353, and in Ill. South Amer. Plants, i. 34. pl. 8 & 9, were first drawn up during my stay in the Organ Mountains in 1837, but not published till 1845, and while these were in type, Dr. Sendtner contributed to the Munich flora his genus *Cyphomandra*, identical with the above, so that by a month's priority in publication, the latter name has claimed the preference. I there divided *Pionandra* into two very distinct sections. 1. *Ceratostemon*,